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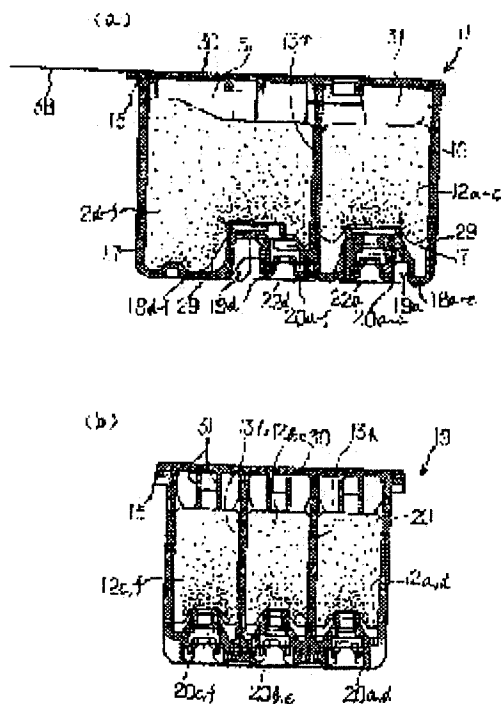
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(54) INK CARTRIDGE



(57)Abstract:

PROBLEM TO BE SOLVED: To hold an increase in an inner volume of an ink cartridge for containing color ink, prevention of erroneous mounting, giving of strength, and uniformity of ink viscosity change.

SOLUTION: A plurality of ink containing chambers 12a to 12f are distributed and disposed. Ink supply ports 20a to 20f communicating with the chambers 12a to 12f are disposed in two rows to facilitate a reduction in size and mounting of an ink cartridge body. And, bottoms of the chambers 12a to 12f are formed in plane with ends of the ports 20a to 20f to increase its volume. Further, a rib 17 is provided on an outer surface to hold its strength, and a longer zigzag groove of a channel is provided as the communicating chamber is smaller to uniformly change the ink viscosity.

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CLAIMS

[Claim(s)]

[Claim 1] The ink cartridge characterized by arranging each ink feed hopper which is [that ink should be supplied to a recording head] open for free passage to each of two or more ink hold rooms as two or more trains on the whole surface of an ink cartridge.

[Claim 2] The ink cartridge according to claim 1 characterized by arranging alternately two or more above-mentioned ink feed hoppers on the whole surface of the above-mentioned ink cartridge.

[Claim 3] The ink cartridge according to claim 1 characterized by arranging two or more above-mentioned ink feed hoppers as two or more trains in the whole surface center section of the above-mentioned ink cartridge.

[Claim 4] The ink cartridge according to claim 1 characterized by arranging two or more above-mentioned ink feed hoppers to the whole surface both-ends side of the above-mentioned ink cartridge.

[Claim 5] The ink cartridge characterized by making each base of two or more ink hold rooms which carried out partition formation inside an ink cartridge with **** of each ink feed hopper which is open for free passage at this each ink hold room, and an abbreviation same side.

[Claim 6] The ink cartridge characterized by to form in the interior opening of the ink cartridge which carried out partition formation of the ink hold room of size plurality so that passage resistance may become large rather than the aeration way which the aeration way which is open for free passage to a wrap lid at the above-mentioned smallness ink hold room among each aeration way where an end is well-informed to each above-mentioned ink hold room, and the other end is well-informed about the open air opens for free passage at the above-mentioned large ink hold room.

[Claim 7] The ink cartridge according to claim 6 characterized by forming so that the aeration way which is open for free passage in the above-mentioned smallness ink hold room among each above-mentioned aeration way where an end is well-informed to each above-mentioned ink hold room, and the other end is well-informed about the open air may become longer than the aeration way which is open for free passage in the above-mentioned large ink hold room.

[Claim 8] The ink cartridge according to claim 6 characterized by forming so that the passage cross-sectional area may become small rather than the aeration way which the aeration way which is open for free passage in the above-mentioned smallness ink hold room among each above-mentioned aeration way where an end is well-informed to each above-mentioned ink hold room, and the other end is well-informed about the open air opens for free passage in the above-mentioned large ink hold room.

[Claim 9] The ink cartridge according to claim 6 characterized by having used the long film for this film and preparing slitting for making this long film open the above-mentioned through-hole

for free passage in the open air while forming the slot which formed in the above-mentioned lid each above-mentioned aeration way where an end is well-informed to each above-mentioned ink hold room, and the other end is well-informed about the open air, and the top face of the above-mentioned lid with the wrap film.

[Claim 10] The ink cartridge characterized by protruding the protruding line for reinforcement of the depth direction on the side attachment wall of the above-mentioned ink cartridge while preparing in the interior the rib for reinforcement which made the width of a longitudinal direction with size rather than the width of a cross direction to opening of the ink cartridge which carried out partition formation of two or more ink hold rooms.

[Claim 11] The ink cartridge according to claim 10 characterized by preparing the R gradually made small to the bottom surface part side from an opening side in the side-attachment-wall corner part of the above-mentioned ink cartridge.

[Claim 12] The ink cartridge characterized by having changed the location inside and cutting inside at least one slot for incorrect wearing prevention which arrives at a base in the side attachment wall of the ink cartridge which carried out partition formation of two or more ink hold rooms for every model.

[Claim 13] The ink cartridge according to claim 12 characterized by having changed the **-like projection for incorrect wearing prevention of at least one on the side attachment wall of the above-mentioned cartridge, having changed the location for every model, and protruding.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink cartridge used for the ink jet recording apparatus of a color.

[0002]

[Description of the Prior Art] The ink cartridge which carried out partition formation of a required number of the ink hold rooms is used for the printer of the format of performing record writing using each ink, such as yellow, a Magenta, cyanogen, and black, especially the ink jet printer of a color.

[0003] In this kind of ink cartridge, not only in the ink of each colors, such as yellow, a Magenta, and cyanogen Although it must be made also to have to hold the ink of two sorts of shades about these colors in order to take a concentration multiple-value-ized recording method depending on the need When the ink hold room in which these ink is held has been arranged to the single tier Since a limitation is to make an ink feed hopper small and width of an ink hold room cannot be narrowed beyond the need, It is inducement **** about the problem which an ink cartridge is enlarged extremely and causes a problem to the loading in the thing of an on-carriage type, and also causes a location gap to a cross direction on the occasion of loading of a cartridge etc., and may break an ink supply needle.

[0004] Moreover, although it is necessary to make thickness of a septum etc. thin for enlarging content volume of each ink hold room within the ink cartridge of the limited magnitude Although a reinforcement-problem occurs in this and it is necessary to arrange carriage with fixed magnitude from a viewpoint on manufacture and management in a recording apparatus side If the appearance of various kinds of ink cartridges is arranged in order to respond to this, the

problem which may cause a loading mistake will be derived. Further When the dimension of an ink cartridge is made small in order to make it carry in carriage The content volume of an ink hold room which holds ink with little amount used becomes still smaller, and un-arranging [that a big difference will arise on the viscosity of each ink also by evaporation of slight ink] arises.

[0005]

[Problem(s) to be Solved by the Invention] the place which this invention was made in view of such a problem, and is made into the purpose -- the appearance of an ink cartridge -- abbreviation -- even when it makes with the same configuration, it is in offering the new ink cartridge which can hold as many various kinds of ink as possible according to the amount used.

[0006] Moreover, the place made into other purposes of this invention is equipped with sufficient rigidity, without spoiling content volume, and is to offer the new ink cartridge which moreover does not produce a loading mistake.

[0007] Furthermore, the place made into another purpose of this invention is by giving a difference for the evaporation of ink according to the capacity of ink to offer the new ink cartridge which can maintain the viscosity of each ink to homogeneity mostly.

[0008]

[Means for Solving the Problem] This invention each ink feed hopper which is open for free passage to each of two or more ink hold rooms as an ink cartridge for attaining the starting technical problem namely, by arranging as two or more trains on the whole surface of an ink cartridge It enables it to make an ink hold room small, without being regulated by the magnitude of an ink feed hopper. Moreover, it is made for passage resistance to become large rather than the aeration way where the aeration way which is open for free passage in a small ink hold room opens for free passage the aeration way where an end is well-informed to an ink hold room, and the other end is well-informed about the open air in opening of an ink cartridge at a wrap lid in a large ink hold room. Capacity is [how] scrupulous and enable it to maintain the viscosity of ink to homogeneity mostly that there is nothing, and further, while preparing the rib for reinforcement which made the width of a longitudinal direction with size rather than the width of a cross direction to opening of an ink cartridge Even if it makes thickness small by protruding the protruding line for reinforcement of the depth direction on the side attachment wall, it enables it to suppress the effect of [on reinforcement] as much as possible. Further By changing the *-like projection for incorrect wearing prevention of at least one, and protruding a location for every model, a loading mistake is lost on the side attachment wall of a cartridge.

[0009]

[Embodiment of the Invention] Then, the example of this invention is explained below. Drawing 1 shows the ink cartridge which makes one example of this invention used for the ink jet recording apparatus which takes a concentration multiple-value recording method.

[0010] Partition formation of the ink hold room 2f which holds the ink of each ink hold room 2 a-e which holds each ink of a Magenta, cyanogen, and yellow, and a Magenta and each **** ink of cyanogen, and black with a bigger capacity than these in this ink cartridge body 1 is carried out through 3h of horizontal septa, respectively.

[0011] Even if it forms as thinly as possible each ink hold room 2 a-f so that ink feed hopper 4 a-f which is open for free passage to a that bottom flat-tapped side at each ink hold room 2 a-f may be arranged alternately and may stop the dimension of the ink cartridge body 1, it is constituted by this ink cartridge body 1 so that each ink feed hopper 4 a-f may not interfere each other.

[0012] Thus, when the tooth back of recording head p is equipped with the constituted ink cartridge body 1 and the ink supply needle q corresponding to each ink feed hopper 4 a-f is

inserted, each ink held in each ink hold room 2 a-f will be supplied to the basis of each nozzle t of a nozzle plate s through the ink passage r.

[0013] In this example, the ink cartridge body 1 can be formed in that part small by forming thinly each ink hold room 2 a-f that there is no ***** in the outer diameter of ink feed hopper 4 a-f.

[0014] Drawing 2 is what was constituted as an ink cartridge corresponding to full color record which used cyanogen, a Magenta, yellow, and four sorts of ink of black. This drawing (b) is what carried out the division configuration only of the ink hold room 2d which holds the ink of black. The appearance of an ink cartridge 1 can be formed in the part small, without being restrained by the outer diameter of ink feed hopper 4 a-d by arranging alternately each ink feed hopper 4 a-d like [these] the 1st example.

[0015] Drawing 3 is constituted as an ink cartridge used for the ink jet recording apparatus which takes a shade multiple-value recording method. On the ink cartridge body 1 shown in this drawing (a) A total of eight ink hold room 2 a-h which holds the ink of two sorts of each shades about cyanogen, a Magenta, yellow, and black Partition formation is carried out at a time at four right and left through septum 3upsilon of one length, and 3h of septa of three width, and as vertical septum 3v is inserted, in the center, each ink hold room 2 a-h and ink feed hopper 4 a-h open for free passage further Even if it does not form so thinly each ink hold room 2 a-h by being arranged in the array location of the ink supply needle q by the side of recording head p as it doubles, and distributing each ink hold room 2 a-h to right and left, while being able to miniaturize the ink cartridge body 1, the inclination at the time of equipping with an ink cartridge can be lost, and the wearing can be ensured [more easily and].

[0016] Although content volume of each ink hold room a-h is made the same in this example As the ink hold room where capacity is big, and the ink hold room where capacity is small can be distributed to right and left, and can also be arranged according to the amount used and it was shown in drawing 3 (b) like the example shown in drawing 8 (a) While distributing each ink hold room 2 a-d which holds each shade ink to right and left and arranging it about cyanogen and a Magenta About ink hold room 2 e-f which holds each ink of the yellow and black which are the amount used, and which become size other ink hold room 2 a-d -- like -- length -- **** -- and -- without it carries out -- ink feed hopper 4 e-f -- other ink feed hoppers 4 -- it leans and can arrange so that it may become a, c, and the same rank.

[0017] On the other hand, the example shown in drawing 4 is what arranged each eight ink hold room 2 a-h at the both-sides edge of the ink cartridge body 1. Only by according to this example, doubling the location of ink feed hopper 4 a-h with the location of each ink supply needle q of recording head p, and shifting only the location of vertical septum 3upsilon, as shown in this drawing (a) The image which was conscious of the graininess of highlights like natural drawing, a portrait, or a photograph, As the volume of each ink hold room 2 a-h can be changed according to the application and it was shown in this drawing (b), the image mainly concerned with the graph and the text By dividing the inside of the ink cartridge body 1 with septum 3upsilon of the length of one sheet Ink hold room 2 a-d with a big capacity and another side are distributed as ink hold room 2 e-h with a small capacity, and one side can be arranged. Further as shown in this drawing (c), without it changes the location of ink feed hopper 4 a-f -- yellow and each ink hold room of black -- these big amount used can be made to cope with it by excluding vertical septum 3upsilon about 2ef(s)

[0018] Although each example described above arranges the ink feed hopper 4 in two trains, it can also make the train of an ink feed hopper three trains or the train beyond it with the number

of the ink hold rooms 2 or the configuration required of an ink cartridge, a dimension, etc.

[0019] By the way, without weakening the reinforcement of the ink cartridge itself for two or more ink hold rooms inside the ink cartridge of the limited magnitude, as the example shown in drawing 5 thru/or drawing 7 gives the biggest moreover possible hold volume, homogeneity is made to maintain the viscosity of ink, and it makes and forms it.

[0020] This ink cartridge body 11 is made from the polypropylene which is inferior a little in reinforcement, although the transmittance of a steam is low. It is formed in the shape of a rectangular parallelepiped so that all possible ink can be held. In the interior Use one septa 13upsilon and 13upsilon perpendicularly, use 13h of two septa horizontally, and partition formation of two-sort ink hold room 12 a-f of six rooms from which width of face is equal and content volume differs is carried out at two steps of three trains. In ink hold room (henceforth areole) 12 a-c of the narrower one Each light ink of a Magenta and cyanogen and the ink of yellow are held, respectively so that each ink of a deep Magenta and cyanogen and the ink of black can take out neutral colors to ink hold room (henceforth Omuro) 12 d-f of the larger one.

[0021] Rather than a cross direction, the rib 15 for reinforcement which made width of a longitudinal direction large ****s, and it is formed in this ink cartridge body 11 in that opening periphery. On each side attachment wall 16 The rib 17 for deformation prevention which served as per whenever [of a detector] is projected and formed in the depth direction. Further into the corner part of each of these side attachment walls 16 Fixing mostly each thickness by the side of opening and a base, as shown in drawing 6 , it is formed so that it may apply to a bottom surface part side (this drawing b) from an opening side (this drawing a) and each internal and external Rs r and R may be gradually made small.

[0022] On the other hand, each [these] ink hold room 12 a-f so that content volume may serve as size as much as possible It is formed so that it may become the base of the ink cartridge body 11, and the same field about each base 18. In these bases 18 The location notches 19a and 19d respectively common to areole 12 a-c and Omuro 12 d-f are cut. In these slot 19a and 19d It projects and the ink feed hoppers 20a-20f of the shape of the pars basilaris ossis occipitalis of each ink hold room 12 a-f and a cylinder open for free passage are formed so that it may become the same height as each base 18 of ink hold room 12 a-f about the edge, and the closure of each of these openings is carried out on the common tapes 22a and 22d.

[0023] Moreover, in this ink cartridge 11, as shown in drawing 7 (b) The slot 24 for incorrect wearing prevention is established in 13h of septa which divide the ink hold rooms 12e and 12f where the side attachment wall 16 of longitudinal direction one of these adjoins. Moreover, the ridge projection 25 for incorrect wearing prevention is projected and formed also above the side attachment wall 16, and it is constituted so that incorrect wearing may be prevented by whether it can engage with the projected part prepared in the carriage which is not illustrated.

[0024] Although one slot 24 for incorrect wearing prevention in this example is established in the part of 13h of septa which divide the 1st and the 2nd ink rooms 12e and 12f Changing a location for every model or making the number of slots 24 into plurality etc. is constituted so that various kinds of ink cartridges may be identified and incorrect wearing can be prevented with the combination of the location of a slot 24, and a number. This can say that the same is said of the projection 25 for incorrect wearing prevention prepared in the upper part of a side attachment wall 16.

[0025] The sign 30 in drawing is the lid which closes opening of the ink cartridge body 11. On the other hand, this lid 30 The same flat-surface configuration as the rim of the stiffening rib 15 prepared in opening of a body 11 to nothing and this inside As shown in drawing 5 (b), the

longitudinal ribs 31 and 31 of two trains which press the form 29 held in ink hold room 12 a-f It is prepared every ink hold room 12 a-f, and these longitudinal ribs 31 and 31 are formed further more highly than the part of others [part / of ink feed hopper 20 approach]. By the strong capillarity obtained by cooperating with the ink feed hopper 20 projected and formed in the interior of the ink hold room 12, pressing the form 29 of this part more strongly, and reducing a hole the ink absorbed by homogeneity in form 29 can be brought together in the part of the ink feed hopper 20 with reduction in ink -- as -- a configuration -- now, it is.

[0026] Opening of the ink cartridge body 11 on the other hand, to the wrap lid 30 As shown in drawing 8 (b), penetration formation of through-hole 34 a-f which was made to correspond to each ink hold room 12 a-f, and served both as restoration and the air vent of ink is carried out. In this top face A leader is open for free passage to through-hole 34 a-f, and the snake slot 35 where an end is extended to through-hole section 36 a-f prepared in the top face by the side of Omuro 12 d-f is formed in the shape of a maze every ink hold room 12 a-f. And the direction of snake slot 35 a-c which is open for free passage to areole 12 a-c from snake slot 35 d-f which is open for free passage to Omuro 12 d-f is formed for a long time far. When a film 38 is ****(ed) and the inside of each ink hold room 12 a-f is wide opened to atmospheric air, it is constituted so that evaporation of the ink in areole 12 a-c may be made fewer than the evaporation of the ink of Omuro 12d - f.

[0027] As shown in drawing 9 (a) and (b), these snake slots 35 can also constitute by forming small the passage cross section in the direction of snake slot 35 a-c which is open for free passage to areole 12 a-c, and enlarging passage resistance rather than snake slot 35 d-f which is open for free passage to Omuro 12 d-f, so that evaporation of the ink in areole 12 a-c may be made fewer than the evaporation of the ink of Omuro 12 d-f. arranging in the shape of a triangle so that 36d of through-hole sections may **** through-hole section 36 a-f of the end of these snake slots 35 in one of the through-hole section 36 a-f of these after being collected into a piece place, and this example and top-most vertices may be formed in a direction -- a film 38 -- easy -- ***** -- it is constituted like.

[0028] On the other hand, it have the dimension with which one side be equivalent to the width of a lid 30, the shape of a rectangle of the dimension in which the other sides exceed the die length of a lid 30 be make, and the cut 39 which can open the through-hole section 36 to atmospheric air be form in that 1 side so that it can form, if the film 38 which close the top face of the snake slot 35 which lead to this through-hole 34 a-f cut reel material simply.

[0029] Thus, the constituted ink cartridge body 11 Although steamy transmittance is low, in spite of being fabricated with polypropylene flexible and weak also in reinforcement, to the opening peristome with the rib 15 for reinforcement which made lateral width larger than a lengthwise direction By the rib 17 of the depth direction which the longitudinal direction and cross direction of the ink cartridge body 11 were mostly reinforced by homogeneity, and was established in the side attachment wall 16, and Rs R and r formed at the corner part so that it might become small gradually from an opening side to a bottom surface part side It makes it possible to save at a long period of time with the low permeability property of the steam which polypropylene has, without degrading ink at the same time the height direction of the ink cartridge body 11 will also be reinforced, it makes the thickness as thin as possible and it increases the hold force of ink.

[0030] And stable installation to carriage can be aimed at, aiming at prevention of the incorrect wearing between the engagement projected parts prepared in carriage without affecting the form 29 in ink hold room 12 a-d by having made the slot 24 for incorrect wearing prevention of the depth direction which arrives at a base 18 meet a septum 13, and having made and established it

in it at the side attachment wall 16 of the ink cartridge body 11.

[0031] By the way, although the example shown by drawing 5 thru/or drawing 9 is related with the reinforcement about the ink cartridge which distributed ink hold room 12 a-f to right and left, and has arranged it, and viscous equalization of ink, these technical problems do not need to say that it can apply not only to the ink cartridge of the distribution arrangement type of an ink hold room but to the thing of 1 train arrangement type shown in drawing 1 , and the example shown in drawing 10 thru/or 12 is related with this kind of ink cartridge.

[0032] Partition formation of ink hold room 42 a-c which holds each ink of a Magenta, cyanogen, and yellow, and the ink hold room 42d which holds the ink of black with width larger than these is carried out through the septum 43 at this ink cartridge body 41, respectively.

[0033] On this ink cartridge body 41, so that reinforcement in every direction may become equal in that opening periphery Rather than a cross direction, the rib 45 for reinforcement which made the width of a longitudinal direction with size ****s, and is formed. On each side attachment wall 46 of a cross direction and a longitudinal direction As shown in drawing 11 , the rib 47 for deformation prevention which served as per whenever [of a detector] is projected and formed in the depth direction. Further into the corner part of these side attachment walls 46 it is formed so that it may apply to a bottom surface part side from an opening side and an internal and external R may be gradually made small, where each thickness by the side of opening and a base is made into about 1 law.

[0034] furthermore, on this ink cartridge body 1 A groove is cut in the side attachment wall 46 of the longitudinal direction end so that the slot 54 for incorrect wearing prevention which arrives at a base 48 may meet a septum. Moreover, the ridge projection 55 for incorrect wearing prevention is formed in the upper part, and it is made to engage with the projection for discernment and crevice which protruded on the slot 54 for these incorrect wearing prevention, and the interior of the carriage which does not illustrate the ridge projection 55, and it is constituted so that a wearing mistake may be lost.

[0035] On the other hand, each base 48 of these ink hold room 42 a-d Partition formation is carried out by the slot 49 in alignment with each septum 43 as shown in drawing 12 (a). At the end of these bases Ink feed hopper 50 a-d of the shape of a cylinder combined mutually projects, and is formed, and further, these ink feed hopper 50 a-d is combined with the frame 52 with the rib 51, respectively, after being enclosed in the shape of a strip of paper with the frame 52 of right and left of a periphery.

[0036] The frame 52 of these right and left is the inside [paries lateralis orbitae / 46]. And ink feed hopper 50a of both ends, After having been formed in die length which is projected a little rather than 50d, sticking the tape 58 of one sheet on it and closing all ink feed hopper 50 a-d to coincidence so that it may not disturb from these frames 52, It is constituted so that this tape 58 may be cut off at the edge of a frame 52, the notch 53 which misses air is further formed in the top ridge section of this frame 52, and it is constituted so that a tape 58 can be stuck certainly.

[0037] In addition, the sign 56 in drawing shows the seal rubber which aims at airtight association with the ink supply needle made from plastics which is inserted in each ink feed hopper 50 a-d, and is open for free passage to a recording head.

[0038] On the other hand, the sign 60 in drawing is the lid which closes opening of the ink cartridge body 41, and as shown in drawing 10 , the longitudinal ribs 61 and 61 of two articles which press the form 59 held in ink hold room 50 a-d set spacing to the inside of this lid 60 every ink hold room 42 a-d, and it is projected and formed in it.

[0039] As shown in this lid 60 at drawing 12 (b), into that center section and the part of ink feed

hopper 50 approach It is made to correspond to each ink hold room 50 a-d, and penetration formation of the ink restoration hole 63 and the air bleed hole 64 is carried out. In the top face of this lid 60 The snake slot 65 extended to prepared through-hole section 66 a-d is formed in the shape of a maze every ink hold room 42 a-d. a leader -- an air bleed hole 64 -- open for free passage -- an end -- others [top face / of a lid 60] -- a half -- others [film / 67 / which has covered a this top using an ink cartridge in the case] -- a half -- the section -- ***** -- by things It is formed so that it may prevent internal ink evaporating by strong passage resistance brought about by this long snake slot 65, at the same time it opens the inside of each ink hold room 42 a-d to atmospheric air.

[0040] furthermore, the through-hole section 66 most projected of these through-hole section 66 a-d after through-hole 66 a-d of the end of these snake slots 65 was summarized to the piece place -- arranging so that b and c may be ****(ed) and the top-most vertices of a direction may be made -- a film 67 -- this part -- easy -- ***** -- it is constituted like.

[0041]

[Effect of the Invention] Since each ink feed hopper which is open for free passage to each of two or more ink hold rooms was arranged as two or more trains on the whole surface of an ink cartridge according to this invention as stated above By whether an ink feed hopper is arranged alternately or an ink hold room is distributed and arranged with an ink feed hopper While making it possible to miniaturize this kind of ink cartridge which makes making sufficiently small the dimension of the thickness direction of an ink hold room, without being regulated by the outer diameter of an ink feed hopper as it is possible, and uses it for the ink jet recording apparatus of a full color format as much as possible By having made each base of these ink hold rooms that carried out partition formation with **** of an ink feed hopper, and an abbreviation same side in the ink cartridge the appearance configuration of an ink cartridge -- the thing of other models, and abbreviation -- even when it forms in the same appearance configuration, it can enlarge the volume of each ink hold room as much as possible, and these exchange frequency is not only mitigable, but can exclude the futility of an ink cartridge.

[0042] And viscosity can suppress evaporation of the ink of the small ink hold interior of a room which changes a lot as much as possible, and can make the record writing stabilized over the long period of time perform also by slight evaporation by having made it longer than the aeration way which opens for free passage the aeration way which opens for free passage the aeration way established in a lid in a small ink hold room in a large ink hold room.

[0043] Furthermore, since the rib for reinforcement which made the width of a longitudinal direction with size rather than the cross direction to opening of an ink cartridge body was prepared and the protruding line for reinforcement prolonged in the depth direction was prepared in the side attachment wall Even when an ink cartridge is formed in closing in so that as many color ink of each color as possible can be held with a flexible material The time of migration of carriage can make the rigidity which can fully be borne also to the vibration accompanying the transit, or fluctuation of acceleration give from the first. Further By having changed the location on this side attachment wall, and having established the slot for incorrect wearing prevention which arrives at a base in it for every model Even when it forms so that a model may be involved how in this kind of ink cartridge and the same appearance [be / nothing] may be made By making a septum meet and preparing this slot, while that incorrect wearing can be certainly prevented by making it engage with the projection for discernment prepared in the carriage side It can give epicritic [positive], without [without it narrows the content volume of the limited

ink hold room, and] making the elastic member held in the interior deform, and giving trouble to supply of ink.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the ink cartridge used for the ink jet recording apparatus of a color.

PRIOR ART

[Description of the Prior Art] The ink cartridge which carried out partition formation of a required number of the ink hold rooms is used for the printer of the format of performing record writing using each ink, such as yellow, a Magenta, cyanogen, and black, especially the ink jet printer of a color.

[0003] Not only the ink of each colors [ink cartridge / this kind of], such as yellow, a Magenta, and cyanogen, but need Although it must be made also to have to hold the ink of two sorts of shades about these colors in order to take a ***** multiple-value-ized recording method When the ink hold room in which these ink is held has been arranged to the single tier Since a . limitation is to make an ink feed hopper small and width of an ink hold room cannot be narrowed beyond the need, It is inducement **** about the problem which an ink cartridge is enlarged extremely and causes a problem to the loading in the thing of an on-carriage type, and also causes a location gap to a cross direction on the occasion of loading of a cartridge etc., and may break an ink supply needle.

[0004] Moreover, it is although it is necessary to make thickness of a septum etc. thin for enlarging content volume of each ink hold room within the ink cartridge of the limited magnitude, Although a reinforcement-problem occurs in this and it is necessary to arrange carriage with fixed magnitude from a viewpoint on manufacture and management in a recording apparatus side If the appearance of various kinds of ink cartridges is arranged in order to respond to this, the problem which may cause a loading mistake will be derived. Further When the dimension of an ink cartridge is made small in order to make it carry in carriage The content volume of an ink hold room which holds ink with little amount used becomes still smaller, and un-arranging [that a big difference will arise on the viscosity of each ink also by evaporation of slight ink] arises.

EFFECT OF THE INVENTION

[Effect of the Invention] As stated above, in this invention, each ink feed hopper which is open for free passage to each of two or more ink hold rooms was arranged as two or more trains on the whole surface of an ink cartridge. Therefore, by whether an ink feed hopper is arranged alternately or an ink hold room is distributed and arranged with an ink feed hopper While making it possible to miniaturize this kind of ink cartridge which makes making sufficiently small the dimension of the thickness direction of an ink hold room, without being regulated by the outer diameter of an ink feed hopper as it is possible, and uses it for the ink jet recording apparatus of a

full color format as much as possible By having made each base of these ink hold rooms that carried out partition formation with **** of an ink feed hopper, and an abbreviation same side in the ink cartridge the appearance configuration of an ink cartridge -- the thing of other models, and abbreviation -- even when it forms in the same appearance configuration, it can enlarge the volume of each ink hold room as much as possible, and these exchange frequency is not only mitigable, but can exclude the futility of an ink cartridge.

[0042] And viscosity can suppress evaporation of the ink of the small ink hold interior of a room which changes a lot as much as possible, and can make the record writing stabilized over the long period of time perform also by slight evaporation by having made it longer than the aeration way which opens for free passage the aeration way which opens for free passage the aeration way established in a lid in a small ink hold room in a large ink hold room.

[0043] furthermore -- since the rib for reinforcement which made the width of a longitudinal direction with size rather than the cross direction to opening of an ink cartridge body was prepared and the protruding line for reinforcement prolonged in the depth direction was prepared in the side attachment wall Even when an ink cartridge is formed in closing in so that as many color ink of each color as possible can be held with a flexible material The time of migration of carriage can make the rigidity which can fully be borne also to the vibration accompanying the transit, or fluctuation of acceleration give from the first. Further By having changed the location on this side attachment wall, and having established the slot for incorrect wearing prevention which arrives at a base in it for every model Even when it forms so that a model may be involved how in this kind of ink cartridge and the same appearance [be / nothing] may be made By making a septum meet and preparing this slot, while that incorrect wearing can be certainly prevented by making it engage with the projection for discernment prepared in the carriage side It can give epicritic [positive], without [without it narrows the content volume of the limited ink hold room, and] making the elastic member held in the interior deform, and giving trouble to supply of ink.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] the place which this invention was made in view of such a problem, and is made into the purpose -- the appearance of an ink cartridge -- abbreviation -- even when it makes with the same configuration, it is in offering the new ink cartridge which can hold as many various kinds of ink as possible according to the amount used.

[0006] Moreover, the place made into other purposes of this invention is equipped with sufficient rigidity, without spoiling content volume, and is to offer the new ink cartridge which moreover does not produce a loading mistake.

[0007] Furthermore, the place made into another purpose of this invention is by giving a difference for the evaporation of ink according to the capacity of ink to offer the new ink cartridge which can maintain the viscosity of each ink to homogeneity mostly.

MEANS

[Means for Solving the Problem] This invention each ink feed hopper which is open for free passage to each of two or more ink hold rooms as an ink cartridge for attaining the starting technical problem namely, by arranging as two or more trains on the whole surface of an ink cartridge It enables it to make an ink hold room small, without being regulated by the magnitude of an ink feed hopper. Moreover, it is made for passage resistance to become large rather than the aeration way where the aeration way which is open for free passage in a small ink hold room opens for free passage the aeration way where an end is well-informed to an ink hold room, and the other end is well-informed about the open air in opening of an ink cartridge at a wrap lid in a large ink hold room. Capacity is [how] scrupulous and enable it to maintain the viscosity of ink to homogeneity mostly that there is nothing, and further, while preparing the rib for reinforcement which made the width of a longitudinal direction with size rather than the width of a cross direction to opening of an ink cartridge Even if it makes thickness small by protruding the protruding line for reinforcement of the depth direction on the side attachment wall, it enables it to suppress the effect of [on reinforcement] as much as possible. Further By changing the *-like projection for incorrect wearing prevention of at least one, and protruding a location for every model, a loading mistake is lost on the side attachment wall of a cartridge.

[0009]

[Embodiment of the Invention] Then, the example of this invention is explained below. Drawing 1 shows the ink cartridge which makes one example of this invention used for the ink jet recording apparatus which takes a concentration multiple-value recording method.

[0010] Partition formation of the ink hold room 2f which holds the ink of each ink hold room 2 a-e which holds each ink of a Magenta, cyanogen, and yellow, and a Magenta and each **** ink of cyanogen, and black with a bigger capacity than these in this ink cartridge body 1 is carried out through 3h of horizontal septa, respectively.

[0011] Even if it forms as thinly as possible each ink hold room 2 a-f so that ink feed hopper 4 a-f which is open for free passage to a that bottom flat-tapped side at each ink hold room 2 a-f may be arranged alternately and may stop the dimension of the ink cartridge body 1, it is constituted by this ink cartridge body 1 so that each ink feed hopper 4 a-f may not interfere each other.

[0012] Thus, when the tooth back of recording head p is equipped with the constituted ink cartridge body 1 and the ink supply needle q corresponding to each ink feed hopper 4 a-f is inserted, each ink held in each ink hold room 2 a-f will be supplied to the basis of each nozzle t of a nozzle plate s through the ink passage r.

[0013] In this example, the ink cartridge body 1 can be formed in that part small by forming thinly each ink hold room 2 a-f that there is no ***** in the outer diameter of ink feed hopper 4 a-f.

[0014] Drawing 2 is what was constituted as an ink cartridge corresponding to full color record which used cyanogen, a Magenta, yellow, and four sorts of ink of black. This drawing (b) is what carried out the division configuration only of the ink hold room 2d which holds the ink of black. The appearance of an ink cartridge 1 can be formed in the part small, without being restrained by the outer diameter of ink feed hopper 4 a-d by arranging alternately each ink feed hopper 4 a-d like [these] the 1st example.

[0015] Drawing 3 is constituted as an ink cartridge used for the ink jet recording apparatus which takes a shade multiple-value recording method. On the ink cartridge body 1 shown in this

drawing (a) A total of eight ink hold room 2 a-h which holds the ink of two sorts of each shades about cyanogen, a Magenta, yellow, and black Partition formation is carried out at a time at four right and left through septum 3upsilon of one length, and 3h of septa of three width, and as vertical septum 3v is inserted, in the center, each ink hold room 2 a-h and ink feed hopper 4 a-h open for free passage further Even if it does not form so thinly each ink hold room 2 a-h by being arranged in the array location of the ink supply needle q by the side of recording head p as it doubles, and distributing each ink hold room 2 a-h to right and left, while being able to miniaturize the ink cartridge body 1, the inclination at the time of equipping with an ink cartridge can be lost, and the wearing can be ensured [more easily and].

[0016] Although content volume of each ink hold room a-h is made the same in this example As the ink hold room where capacity is big, and the ink hold room where capacity is small can be distributed to right and left, and can also be arranged according to the amount used and it was shown in drawing 3 (b) like the example shown in drawing 8 (a) While distributing each ink hold room 2 a-d which holds each shade ink to right and left and arranging it about cyanogen and a Magenta About ink hold room 2 e-f which holds each ink of the yellow and black which are the amount used, and which become size other ink hold room 2 a-d -- like -- length -- **** -- and -- without it carries out -- ink feed hopper 4 e-f -- other ink feed hoppers 4 -- it leans and can arrange so that it may become a, c, and the same rank.

[0017] On the other hand, the example shown in drawing 4 is what arranged each eight ink hold room 2 a-h at the both-sides edge of the ink cartridge body 1. Only by according to this example, doubling the location of ink feed hopper 4 a-h with the location of each ink supply needle q of recording head p, and shifting only the location of vertical septum 3upsilon, as shown in this drawing (a) The image which was conscious of the graininess of highlights like natural drawing, a portrait, or a photograph, As the volume of each ink hold room 2 a-h can be changed according to the application and it was shown in this drawing (b), the image mainly concerned with the graph and the text By dividing the inside of the ink cartridge body 1 with septum 3upsilon of the length of one sheet Ink hold room 2 a-d with a big capacity and another side are distributed as ink hold room 2 e-h with a small capacity, and one side can be arranged. Further as shown in this drawing (c), without it changes the location of ink feed hopper 4 a-f -- yellow and each ink hold room of black -- these big amount used can be made to cope with it by excluding vertical septum 3upsilon about 2ef(s)

[0018] Although each example described above arranges the ink feed hopper 4 in two trains, it can also make the train of an ink feed hopper three trains or the train beyond it with the number of the ink hold rooms 2 or the configuration required of an ink cartridge, a dimension, etc.

[0019] By the way, without weakening the reinforcement of the ink cartridge itself for two or more ink hold rooms inside the ink cartridge of the limited magnitude, as the example shown in drawing 5 thru/or drawing 7 gives the biggest moreover possible hold volume, homogeneity is made to maintain the viscosity of ink, and it makes and forms it.

[0020] This ink cartridge body 11 is made from the polypropylene which is inferior a little in reinforcement, although the transmittance of a steam is low. It is formed in the shape of a rectangular parallelepiped so that all possible ink can be held. In the interior Use one septa 13upsilon and 13upsilon perpendicularly, use 13h of two septa horizontally, and partition formation of two-sort ink hold room 12 a-f of six rooms from which width of face is equal and content volume differs is carried out at two steps of three trains. In ink hold room (henceforth areole) 12 a-c of the narrower one Each light ink of a Magenta and cyanogen and the ink of yellow are held, respectively so that each ink of a deep Magenta and cyanogen and the ink of

black can take out neutral colors to ink hold room (henceforth Omuro) 12 d-f of the larger one. [0021] Rather than a cross direction, the rib 15 for reinforcement which made width of a longitudinal direction large ****s, and it is formed in this ink cartridge body 11 in that opening periphery. On each side attachment wall 16 The rib 17 for deformation prevention which served as per whenever [of a detector] is projected and formed in the depth direction. Further into the corner part of each of these side attachment walls 16 Fixing mostly each thickness by the side of opening and a base, as shown in drawing 6 , it is formed so that it may apply to a bottom surface part side (this drawing b) from an opening side (this drawing a) and each internal and external Rs r and R may be gradually made small.

[0022] On the other hand, each [these] ink hold room 12 a-f so that content volume may serve as size as much as possible It is formed so that it may become the base of the ink cartridge body 11, and the same field about each base 18. In these bases 18 The location notches 19a and 19d respectively common to areole 12 a-c and Omuro 12 d-f are cut. In these slot 19a and 19d It projects and the ink feed hoppers 20a-20f of the shape of the pars basilaris ossis occipitalis of each ink hold room 12 a-f and a cylinder open for free passage are formed so that it may become the same height as each base 18 of ink hold room 12 a-f about the edge, and the closure of each of these openings is carried out on the common tapes 22a and 22d.

[0023] Moreover, in this ink cartridge 11, as shown in drawing 7 (b) The slot 24 for incorrect wearing prevention is established in 13h of septa which divide the ink hold rooms 12e and 12f where the side attachment wall 16 of longitudinal direction one of these adjoins. Moreover, the ridge projection 25 for incorrect wearing prevention is projected and formed also above the side attachment wall 16, and it is constituted so that incorrect wearing may be prevented by whether it can engage with the projected part prepared in the carriage which is not illustrated.

[0024] Although one slot 24 for incorrect wearing prevention in this example is established in the part of 13h of septa which divide the 1st and the 2nd ink rooms 12e and 12f Changing a location for every model or making the number of slots 24 into plurality etc. is constituted so that various kinds of ink cartridges may be identified and incorrect wearing can be prevented with the combination of the location of a slot 24, and a number. This can say that the same is said of the projection 25 for incorrect wearing prevention prepared in the upper part of a side attachment wall 16.

[0025] The sign 30 in drawing is the lid which closes opening of the ink cartridge body 11. On the other hand, this lid 30 The same flat-surface configuration as the rim of the stiffening rib 15 prepared in opening of a body 11 to nothing and this inside As shown in drawing 5 (b), the longitudinal ribs 31 and 31 of two trains which press the form 29 held in ink hold room 12 a-f It is prepared every ink hold room 12 a-f, and these longitudinal ribs 31 and 31 are formed further more highly than the part of others [part / of ink feed hopper 20 approach]. By the strong capillarity obtained by cooperating with the ink feed hopper 20 projected and formed in the interior of the ink hold room 12, pressing the form 29 of this part more strongly, and reducing a hole the ink absorbed by homogeneity in form 29 can be brought together in the part of the ink feed hopper 20 with reduction in ink -- as -- a configuration -- now, it is.

[0026] Opening of the ink cartridge body 11 on the other hand, to the wrap lid 30 As shown in drawing 8 (b), penetration formation of through-hole 34 a-f which was made to correspond to each ink hold room 12 a-f, and served both as restoration and the air vent of ink is carried out. In this top face A leader is open for free passage to through-hole 34 a-f, and the snake slot 35 where an end is extended to through-hole section 36 a-f prepared in the top face by the side of Omuro 12 d-f is formed in the shape of a maze every ink hold room 12 a-f. And the direction of snake

slot 35 a-c which is open for free passage to areole 12 a-c from snake slot 35 d-f which is open for free passage to Omuro 12 d-f is formed for a long time far. When a film 38 is ****(ed) and the inside of each ink hold room 12 a-f is wide opened to atmospheric air, it is constituted so that evaporation of the ink in areole 12 a-c may be made fewer than the evaporation of the ink of Omuro 12d - f.

[0027] As shown in drawing 9 (a) and (b), these snake slots 35 can also constitute by forming small the passage cross section in the direction of snake slot 35 a-c which is open for free passage to areole 12 a-c, and enlarging passage resistance rather than snake slot 35 d-f which is open for free passage to Omuro 12 d-f, so that evaporation of the ink in areole 12 a-c may be made fewer than the evaporation of the ink of Omuro 12 d-f. arranging in the shape of a triangle so that 36d of through-hole sections may **** through-hole section 36 a-f of the end of these snake slots 35 in one of the through-hole section 36 a-f of these after being collected into a piece place, and this example and top-most vertices may be formed in a direction -- a film 38 -- easy -- ***** -- it is constituted like.

[0028] On the other hand, it have the dimension with which one side be equivalent to the width of a lid 30, the shape of a rectangle of the dimension in which the other sides exceed the die length of a lid 30 be make, and the cut 39 which can open the through-hole section 36 to atmospheric air be form in that 1 side so that it can form, if the film 38 which close the top face of the snake slot 35 which lead to this through-hole 34 a-f cut reel material simply.

[0029] Thus, the constituted ink cartridge body 11 Although steamy transmittance is low, in spite of being fabricated with polypropylene flexible and weak also in reinforcement, to the opening peristome with the rib 15 for reinforcement which made lateral width larger than a lengthwise direction By the rib 17 of the depth direction which the longitudinal direction and cross direction of the ink cartridge body 11 were mostly reinforced by homogeneity, and was established in the side attachment wall 16, and Rs R and r formed at the corner part so that it might become small gradually from an opening side to a bottom surface part side It makes it possible to save at a long period of time with the low permeability property of the steam which polypropylene has, without degrading ink at the same time the height direction of the ink cartridge body 11 will also be reinforced, it makes the thickness as thin as possible and it increases the hold force of ink.

[0030] And stable installation to carriage can be aimed at, aiming at prevention of the incorrect wearing between the engagement projected parts prepared in carriage without affecting the form 29 in ink hold room 12 a-d by having made the slot 24 for incorrect wearing prevention of the depth direction which arrives at a base 18 meet a septum 13, and having made and established it in it at the side attachment wall 16 of the ink cartridge body 11.

[0031] By the way, although the example shown by drawing 5 thru/or drawing 9 is related with the reinforcement about the ink cartridge which distributed ink hold room 12 a-f to right and left, and has arranged it, and viscous equalization of ink, these technical problems do not need to say that it can apply not only to the ink cartridge of the distribution arrangement type of an ink hold room but to the thing of 1 train arrangement type shown in drawing 1 , and the example shown in drawing 10 thru/or 12 is related with this kind of ink cartridge.

[0032] Partition formation of ink hold room 42 a-c which holds each ink of a Magenta, cyanogen, and yellow, and the ink hold room 42d which holds the ink of black with width larger than these is carried out through the septum 43 at this ink cartridge body 41, respectively.

[0033] On this ink cartridge body 41, so that reinforcement in every direction may become equal in that opening periphery Rather than a cross direction, the rib 45 for reinforcement which made the width of a longitudinal direction with size ****s, and is formed. On each side attachment

wall 46 of a cross direction and a longitudinal direction As shown in drawing 11 , the rib 47 for deformation prevention which served as per whenever [of a detector] is projected and formed in the depth direction. Further into the corner part of these side attachment walls 46 it is formed so that it may apply to a bottom surface part side from an opening side and an internal and external R may be gradually made small, where each thickness by the side of opening and a base is made into about 1 law.

[0034] furthermore, on this ink cartridge body 1 A groove is cut in the side attachment wall 46 of the longitudinal direction end so that the slot 54 for incorrect wearing prevention which arrives at a base 48 may meet a septum. Moreover, the ridge projection 55 for incorrect wearing prevention is formed in the upper part, and it is made to engage with the projection for discernment and crevice which protruded on the slot 54 for these incorrect wearing prevention, and the interior of the carriage which does not illustrate the ridge projection 55, and it is constituted so that a wearing mistake may be lost.

[0035] On the other hand, each base 48 of these ink hold room 42 a-d Partition formation is carried out by the slot 49 in alignment with each septum 43 as shown in drawing 12 (a). At the end of these bases Ink feed hopper 50 a-d of the shape of a cylinder combined mutually projects, and is formed, and further, these ink feed hopper 50 a-d is combined with the frame 52 with the rib 51, respectively, after being enclosed in the shape of a strip of paper with the frame 52 of right and left of a periphery.

[0036] The frame 52 of these right and left is the inside [paries lateralis orbitae / 46]. And ink feed hopper 50a of both ends, After having been formed in die length which is projected a little rather than 50d, sticking the tape 58 of one sheet on it and closing all ink feed hopper 50 a-d to coincidence so that it may not disturb from these frames 52, It is constituted so that this tape 58 may be cut off at the edge of a frame 52, the notch 53 which misses air is further formed in the top ridge section of this frame 52, and it is constituted so that a tape 58 can be stuck certainly.

[0037] In addition, the sign 56 in drawing shows the seal rubber which aims at airtight association with the ink supply needle made from plastics which is inserted in each ink feed hopper 50 a-d, and is open for free passage to a recording head.

[0038] On the other hand, the sign 60 in drawing is the lid which closes opening of the ink cartridge body 41, and as shown in drawing 10 , the longitudinal ribs 61 and 61 of two articles which press the form 59 held in ink hold room 50 a-d set spacing to the inside of this lid 60 every ink hold room 42 a-d, and it is projected and formed in it.

[0039] As shown in this lid 60 at drawing 12 (b), into that center section and the part of ink feed hopper 50 approach It is made to correspond to each ink hold room 50 a-d, and penetration formation of the ink restoration hole 63 and the air bleed hole 64 is carried out. In the top face of this lid 60 The snake slot 65 extended to prepared through-hole section 66 a-d is formed in the shape of a maze every ink hold room 42 a-d. a leader -- an air bleed hole 64 -- open for free passage -- an end -- others [top face / of a lid 60] -- a half -- others [film / 67 / which has covered a this top using an ink cartridge in the case] -- a half -- the section -- ***** -- by things It is formed so that it may prevent internal ink evaporating by strong passage resistance brought about by this long snake slot 65, at the same time it opens the inside of each ink hold room 42 a-d to atmospheric air.

[0040] furthermore, the through-hole section 66 most projected of these through-hole section 66 a-d after through-hole 66 a-d of the end of these snake slots 65 was summarized to the piece place -- arranging so that b and c may be ****(ed) and the top-most vertices of a direction may be made -- a film 67 -- this part -- easy -- ***** -- it is constituted like.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the side elevation having shown the relation between the bottom view of the ink cartridge which makes one example of this invention, and a recording head.

[Drawing 2] Each of (a) and (b) is the bottom views of an ink cartridge showing other examples of this invention.

[Drawing 3] Each of (a) and (b) is the bottom views of an ink cartridge showing still more nearly another example of this invention.

[Drawing 4] (a) Or each (c) is the bottom view of an ink cartridge showing still more nearly another example of this invention.

[Drawing 5] (a) and (b) are the side elevations and front views having shown the ink cartridge which makes other examples of this invention in the cross section.

[Drawing 6] (a) and (b) are drawings having shown the corner part of an ink cartridge same as the above in the cross section.

[Drawing 7] (a) and (b) are the side elevations and front views having shown the lateral surface of an ink cartridge same as the above.

[Drawing 8] (a) and (b) are drawings having shown the base and lid of an ink cartridge same as the above.

[Drawing 9] Each of (a) and (b) is drawings having shown the cross section of a snake slot.

[Drawing 10] (a) and (b) are the side elevations and front views having shown the ink cartridge which makes still more nearly another example of this invention in the cross section.

[Drawing 11] (a) and (b) are the side elevations and front views having shown the lateral surface of an ink cartridge same as the above.

[Drawing 12] (a) and (b) are drawings having shown the base and lid of an ink cartridge same as the above.

[Description of Notations]

1, 11, 41 Ink cartridge body

2 a-d, 12 a-f, 42 a-d Ink hold room

3h, 3upsilon, 13h, 13upsilon, 43 Septum

4 a-d, 20 a-f, 50 a-d Ink feed hopper

30 60 Lid

34 a-f, 64 a-d Through-hole

35 a-f, 65 Snake slot

38 67 Film

CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law

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[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] Claim

[Method of Amendment] Modification

[Proposed Amendment]

[Claim(s)]

[Claim 1] The ink cartridge characterized by arranging each ink feed hopper which is [that ink should be supplied to a recording head] open for free passage to each of two or more ink hold rooms as two or more trains on the whole surface of an ink cartridge.

[Claim 2] The ink cartridge according to claim 1 characterized by arranging alternately two or more above-mentioned ink feed hoppers on the whole surface of the above-mentioned ink cartridge.

[Claim 3] The ink cartridge according to claim 1 characterized by arranging two or more above-mentioned ink feed hoppers as two or more trains in the whole surface center section of the above-mentioned ink cartridge.

[Claim 4] The ink cartridge according to claim 1 characterized by arranging two or more above-mentioned ink feed hoppers to the whole surface both-ends side of the above-mentioned ink cartridge.

[Claim 5] The ink cartridge according to claim 1 characterized by making each base of two or more ink hold rooms which carried out partition formation inside an ink cartridge with **** of each ink feed hopper which is open for free passage at this each ink hold room, and an abbreviation same side.

[Claim 6] The ink cartridge characterized by to form in the interior opening of the ink cartridge which carried out partition formation of the ink hold room of size plurality so that passage resistance may become large rather than the aeration way which the aeration way which is open for free passage to a wrap lid at the above-mentioned smallness ink hold room among each aeration way where an end is well-informed to each above-mentioned ink hold room, and the

other end is well-informed about the open air opens for free passage at the above-mentioned large ink hold room.

[Claim 7] The ink cartridge according to claim 6 characterized by forming so that the aeration way which is open for free passage in the above-mentioned smallness ink hold room among each above-mentioned aeration way where an end is well-informed to each above-mentioned ink hold room, and the other end is well-informed about the open air may become longer than the aeration way which is open for free passage in the above-mentioned large ink hold room.

[Claim 8] The ink cartridge according to claim 6 characterized by forming so that the passage cross-sectional area may become small rather than the aeration way which the aeration way which is open for free passage in the above-mentioned smallness ink hold room among each above-mentioned aeration way where an end is well-informed to each above-mentioned ink hold room, and the other end is well-informed about the open air opens for free passage in the above-mentioned large ink hold room.

[Claim 9] The ink cartridge according to claim 6 characterized by having used the long film for this film and preparing slitting for making this long film open the above-mentioned through-hole for free passage in the open air while forming the slot which formed in the above-mentioned lid each above-mentioned aeration way where an end is well-informed to each above-mentioned ink hold room, and the other end is well-informed about the open air, and the top face of the above-mentioned lid with the wrap film.

[Claim 10] The ink cartridge characterized by protruding the protruding line for reinforcement of the depth direction on the side attachment wall of the above-mentioned ink cartridge while preparing in the interior the rib for reinforcement which made the width of a longitudinal direction with size rather than the width of a cross direction to opening of the ink cartridge which carried out partition formation of two or more ink hold rooms.

[Claim 11] The ink cartridge according to claim 10 characterized by preparing the R gradually made small to the bottom surface part side from an opening side in the side-attachment-wall corner part of the above-mentioned ink cartridge.

[Claim 12] The ink cartridge characterized by having changed the location inside and cutting inside at least one slot for incorrect wearing prevention which arrives at a base in the side attachment wall of the ink cartridge which carried out partition formation of two or more ink hold rooms for every model.

[Claim 13] The ink cartridge according to claim 12 characterized by having changed the *-like projection for incorrect wearing prevention of at least one on the side attachment wall of the above-mentioned cartridge, having changed the location for every model, and protruding.

[Claim 14] each ink feed hopper which said each ink hold room is alike, respectively, and is open for free passage inside while carrying out partition formation of the ink hold room of size plurality -- at least -- two or more -- every -- the ink cartridge arranged at the whole surface so that a straight line parallel to mutual may be alike, respectively and it may be located.

[Claim 15] The ink cartridge according to claim 14 by which the form which absorbed ink is held in said ink hold room.

[Claim 16] the interior is divided by two or more septa in the direction of breadth, and the 1st ink hold room is formed -- both The ink feed hopper which forms the 2nd ink hold room of said 1st ink hold field which divides one to a lengthwise direction by the septum further at least, and adjoins the 1st ink hold room, and is open for free passage in said 1st ink hold room, The ink cartridge which passes through the field of each ink hold room, and is arranged at the straight line parallel to mutual in the ink feed hopper which is open for free passage in said 2nd ink hold

room.

[Claim 17] The ink cartridge according to claim 16 currently formed in [the septum which carries out partition formation of said 1st ink hold room / as an ink cartridge] one.

[Procedure amendment 2]

[Document to be Amended] Specification

[Item(s) to be Amended] 0016

[Method of Amendment] Modification

[Proposed Amendment]

[0016] Although content volume of each ink hold room a-h is made the same in this example As the ink hold room where capacity is big, and the ink hold room where capacity is small can be distributed to right and left, and can also be arranged according to the amount used and it was shown in drawing 3 (b) like the example shown in drawing 8 (a) While distributing each ink hold room 2 a-d which holds each shade ink to right and left and arranging it about cyanogen and a Magenta About ink hold room 2 e-f which holds each ink of the yellow and black which are the amount used, and which become size Without dividing perpendicularly like other ink hold room 2 a-d, it leans and only ink feed hopper 4 e-f can be arranged so that it may become other ink feed hopper 4a, c, and same ranks.

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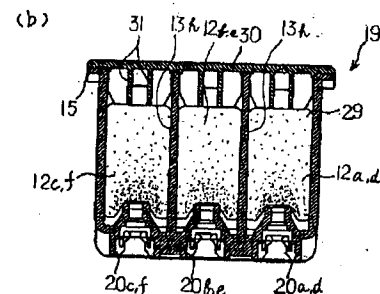
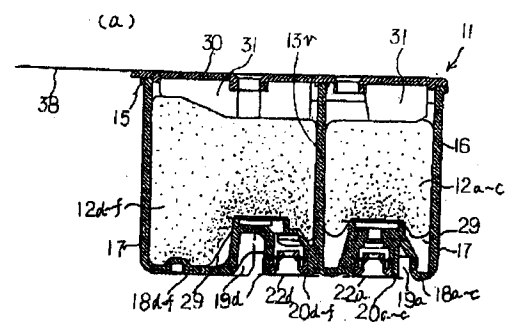
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(54) 【発明の名称】 インクカートリッジ

(57) 【要約】

【課題】 カラーのインクを収容するインクカートリッジの内容積の増大、誤装着防止、強度の付与及びインクの粘性変化の均一性を保つこと。

【解決手段】 複数のインク収容室12a～fを振り分け配置し、さらに、これらに連通するインク供給口20a～fを2列に配置してインクカートリッジ本体1の小型化及び装着の容易性を図るとともに、インク収容室12a～fの底面をインク供給口20a～fの端面と同一面となして容積の増大を図り、さらに外側面にリブ17等を設けて強度を保つようにするとともに、蓋体30の面には、連通するインク収容室2が小さいほど流路の長いへび溝を設けて、インクの粘性が均一に変化するようにしたもの。



【特許請求の範囲】

【請求項1】 記録ヘッドにインクを供給すべく複数のインク収容室のそれぞれに連通する各インク供給口を、インクカートリッジの一面に複数の列として配列したことを特徴とするインクカートリッジ。

【請求項2】 上記複数のインク供給口を、上記インクカートリッジの一面に千鳥状に配列したことを特徴とする請求項1記載のインクカートリッジ。

【請求項3】 上記複数のインク供給口を、上記インクカートリッジの一面中央部に複数の列として配列したことを特徴とする請求項1記載のインクカートリッジ。

【請求項4】 上記複数のインク供給口を、上記インクカートリッジの一面両端側に配列したことを特徴とする請求項1記載のインクカートリッジ。

【請求項5】 インクカートリッジの内部に区画形成した複数のインク収容室の各底面を、該各インク収容室に連通する各インク供給口の口端と略同一面となしたことを特徴とするインクカートリッジ。

【請求項6】 内部に大小複数のインク収容室を区画形成したインクカートリッジの開口部を覆う蓋体に、一端が上記各インク収容室に、他端が外気に通じる各通気路のうち、上記小インク収容室に連通する通気路が上記大インク収容室に連通する通気路よりも流路抵抗が大きくなるように形成したことを特徴とするインクカートリッジ。

【請求項7】 一端が上記各インク収容室に、他端が外気に通じる上記各通気路のうち、上記小インク収容室に連通する通気路が上記大インク収容室に連通する通気路よりも長くなるように形成したことを特徴とする請求項6記載のインクカートリッジ。

【請求項8】 一端が上記各インク収容室に、他端が外気に通じる上記各通気路のうち、上記小インク収容室に連通する通気路が上記大インク収容室に連通する通気路よりも流路断面積が小さくなるように形成したことを特徴とする請求項6記載のインクカートリッジ。

【請求項9】 一端が上記各インク収容室に、他端が外気に通じる上記各通気路を、上記蓋体に形成した溝と上記蓋体の上面を覆うフィルムとによって形成するとともに、該フィルムに長尺フィルムを用いて、該長尺フィルムに上記通孔を外気に連通させるための切り込みを設けたことを特徴とする請求項6記載のインクカートリッジ。

【請求項10】 内部に複数のインク収容室を区画形成したインクカートリッジの開口部に、巾方向の巾よりも長手方向の巾を大とした補強用のリブを設けるとともに、上記インクカートリッジの側壁には深さ方向の補強用の突条を突設したことを特徴とするインクカートリッジ。

【請求項11】 上記インクカートリッジの側壁コーナ一部分に、開口部側から底面部側へ徐々に小さくしたア

ールを設けたことを特徴とする請求項10記載のインクカートリッジ。

【請求項12】 内部に複数のインク収容室を区画形成したインクカートリッジの側壁に、底面に達する少なくとも1本の誤装着防止用の溝を、機種毎に位置を違えて凹設したことを特徴とするインクカートリッジ。

【請求項13】 上記カートリッジの側壁に、少なくとも1本の誤装着防止用の隆状突起を機種毎に位置を違えて突設したことを特徴とする請求項12記載のインクカートリッジ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、カラーのインクジェット記録装置に用いるインクカートリッジに関する。

【0002】

【従来の技術】イエロー、マゼンタ、シアン、ブラックといった各インクを用いて記録書込みを行う形式のプリンタ、特にカラーのインクジェットプリンタには、必要な数のインク収容室を区画形成したインクカートリッジが用いられる。

【0003】この種のインクカートリッジには、イエロー、マゼンタ、シアンといった各色のインクばかりでなく、必要によっては濃度多値化記録方式を採るべく、これらの色について濃淡2種のインクをも収容するようにしなければならないが、これらのインクを収容するインク収容室を一行に配置した場合には、インク供給口を小型にするのに限界があってインク収容室の巾を必要以上に狭めることができないため、インクカートリッジが極端に大型化してしまつて、オンキャリアッジ式のものではその搭載に問題をきたすほか、カートリッジの装填等の際には巾方向に位置ずれを起こしてインク供給針を折損しかねない問題を惹起す。

【0004】また、限られた大きさのインクカートリッジ内で各インク収容室の内容積を大きくしてゆくには隔壁等の肉厚を薄くしてゆく必要があるが、これには強度的な問題が発生し、また、記録装置側では、製造上及び管理上の観点からキャリアッジを一定の大きさに揃える必要があるが、これに応えるべく、各種のインクカートリッジの外形を揃えようと、装填ミスを起しかねない問題が派生し、さらには、キャリアッジに搭載させるべく、インクカートリッジの外形寸法を小さくしていった場合には、使用量の少ないインクを収容するインク収容室の内容積がますます小さくなって、僅かなインクの蒸発によつても個々のインクの粘性に大きな違いが生じてきてしまうといった不都合が生じる。

【0005】

【発明が解決しようとする課題】本発明はこのような問題に鑑みてなされたもので、その目的とするところは、インクカートリッジの外形を略同じ形状となした場合でも、各種のインクを使用量に応じて可能な限り多く収容

することのできる新たなインクカートリッジを提供することにある。

【0006】また、本発明の他の目的とするところは、内容積を損ねることなく十分な剛性を備え、しかも装填ミスを生じさせることのない新たなインクカートリッジを提供することにある。

【0007】またさらに、本発明の別の目的とするところは、インクの蒸発量をインクの収容量に応じて差を持たせることにより、それぞれのインクの粘性をほぼ均一に維持することのできる新たなインクカートリッジを提供することにある。

【0008】

【課題を解決するための手段】すなわち、本発明に係る課題を達成するためのインクカートリッジとして、複数のインク収容室のそれぞれに連通する各インク供給口を、インクカートリッジの一面に複数の列として配列することにより、インク供給口の大きさに規制されることなくインク収容室を小さくすることができるようにしたものであり、また、インクカートリッジの開口部を覆う蓋体に、一端がインク収容室に他端が外気に通じる通気路を、小インク収容室に連通する通気路が大インク収容室に連通する通気路よりも流路抵抗が大きくなるようにして、収容量の如何に拘りなくインクの粘性をほぼ均一に維持することができるようにしたものであり、さらに、インクカートリッジの開口部に巾方向の巾よりも長手方向の巾を大とした補強用のリブを設けるとともに、その側壁には深さ方向の補強用の突条を突設することにより、肉厚を小さくしても、強度上の影響を可能な限り抑え得るようにしたものであり、さらには、カートリッジの側壁に少なくとも1本の誤装着防止用の隆状突起を機種毎に位置を変えて突設することにより、装填ミスをなくすようにしたものである。

【0009】

【発明の実施の形態】そこで以下に本発明の実施例について説明する。図1は、濃度多値記録方式を採るインクジェット記録装置に用いる本発明の一実施例をなすインクカートリッジを示したものである。

【0010】このインクカートリッジ本体1には、マゼンタ、シアン、イエローの各インクと、マゼンタ、シアンの各淡いインクを収容する各インク収容室2a～eと、これらよりも容量の大きなブラックのインクを収容するインク収容室2fがそれぞれ横の隔壁3hを介して区画形成されている。

【0011】このインクカートリッジ本体1には、その底面一侧に、各インク収容室2a～fに連通するインク供給口4a～fが千鳥状に配列されていて、インクカートリッジ本体1の外形寸法を抑えるべく各インク収容室2a～fを可能な限り薄く形成しても、それぞれのインク供給口4a～fが互いに干渉し合わないよう構成されている。

【0012】このように構成されたインクカートリッジ本体1を記録ヘッドpの背面に装着して、各インク供給口4a～fに対応するインク供給針qを挿入すると、各インク収容室2a～f内に収容された各インクは、インク流路rを経てノズルプレートsの各ノズルtのもとに供給されることになる。

【0013】この実施例では、インク供給口4a～fの外径に促われることなく各インク収容室2a～fを薄く形成することにより、インクカートリッジ本体1をその分小型に形成することができる。

【0014】図2は、シアン、マゼンタ、イエロー及びブラックの4種のインクを用いたフルカラー記録対応のインクカートリッジとして構成したもので、同図(b)はブラックのインクを収容するインク収容室2dのみを分割構成したもので、これらも第1の実施例と同様に、各インク供給口4a～dを千鳥状に配列することによりインク供給口4a～dの外径に制約されることなくインクカートリッジ1の外形をその分小型に形成することができる。

【0015】図3は、濃淡多値記録方式を採るインクジェット記録装置に用いるインクカートリッジとして構成したものである。同図(a)に示したインクカートリッジ本体1には、シアン、マゼンタ、イエロー、ブラックについて各濃淡2種のインクを収容する合計8個のインク収容室2a～hが、1つの縦の隔壁3vと3つの横の隔壁3hを介して左右に4個ずつ区画形成され、さらに、縦の隔壁3vを挟むようにしてその中央には、各インク収容室2a～hと連通するインク供給口4a～hが、記録ヘッドp側のインク供給針qの配列位置に合わせるようにして配設され、各インク収容室2a～hを左右に振り分けることにより、各インク収容室2a～hをさほど薄く形成しなくともインクカートリッジ本体1を小型化することができるとともに、インクカートリッジを装着する際の傾きをなくして、その装着をより容易に、かつより確実に行うことができる。

【0016】この実施例では、各インク収容室a～hの内容積を同じにしたものであるが、図8(a)に示した実施例のように、使用量に応じて容量の大きなインク収容室と容量の小さなインク収容室を左右に振り分け配置することもでき、また、図3(b)に示したように、シアン、マゼンタについてはそれぞれの濃淡インクを収容する各インク収容室2a～dを左右に振り分け配置する一方、使用量の大なるイエロー及びブラックの各インクを収容するインク収容室2e～fについては、他のインク収容室2a～dのように縦にぶんかつすることなく、インク供給口4e～fのみを他のインク供給口4a、cと同列になるように一方に偏して配設するようにすることもできる。

【0017】これに対して図4に示した実施例は、8個の各インク収容室2a～hをインクカートリッジ本体1

の両側端に配列するようにしたもので、この実施例によれば、同図（a）に示したように、インク供給口4 a～hの位置を記録ヘッドpの各インク供給針qの位置に合わせ、単に縦の隔壁3 vの位置のみをずらすだけで、自然画、人物画や写真のように、ハイライトの粒状性を意識した画像や、グラフ、テキストを主とした画像等、その用途に応じて各インク収容室2 a～hの容積を変えるようにすることもでき、また、同図（b）に示したように、インクカートリッジ本体1内を1枚の縦の隔壁3 vで仕切ることにより、一方を容量の大きなインク収容室2 a～d、他方を容量の小さなインク収容室2 e～hとして振り分け配置するようにすることもでき、さらには、同図（c）に示したように、インク供給口4 a～fの位置を変えることなく、イエロー、ブラックの各インク収容室2 e fについては縦の隔壁3 vを省くことによってこれらの大きな使用量に対処させることができる。

【0018】以上述べた実施例は、いずれもインク供給口4を2列に配列したものであるが、インク収容室2の数、あるいはインクカートリッジに要求される形状、寸法等によっては、インク供給口の列を3列あるいはそれ以上の列にすることもできる。

【0019】ところで、図5乃至図7に示した実施例は、限られた大きさのインクカートリッジの内部に複数のインク収容室を、インクカートリッジ自体の強度を弱めることなく、しかも可能な限り大きな収容容積を持たせるようにして、かつインクの粘性を均一に維持させるようにして、形成したものである。

【0020】このインクカートリッジ本体11は、水蒸気の透過度は低いが、強度的には若干劣るポリプロピレンを素材として、可能な限りのインクを収容し得るよう直方体状に形成され、その内部には、縦に1つの隔壁13 v、13 v、横に2つの隔壁13 hを用いて、幅が等しく内容積が異なる2種6室のインク収容室12 a～fが3列2段に区画形成され、狭い方のインク収容室（以下小室という）12 a～cには、濃いマゼンタ、シアンの各インクとブラックのインクが、広い方のインク収容室（以下大室という）12 d～fには、中間色を出すことができるように、淡いマゼンタ及びシアンの各インクと、イエローのインクがそれぞれ収容されている。

【0021】このインクカートリッジ本体11には、その開口部周縁に、巾方向よりも長手方向の巾を広くした補強用のリブ15が張出し形成され、また、各側壁16には、検出器の度当りを兼ねた変形防止用のリブ17が深さ方向に突出形成され、さらに、これらの各側壁16のコーナ部分には、図6に示したように、開口部側と底面側の各肉厚をほぼ一定にしつつ、開口部側（同図a）から底面側（同図b）へかけて内外の各アールr、Rを徐々に小さくするように形成されている。

【0022】一方、これら各インク収容室12 a～fは、可能な限り内容積が大となるように、各底面18を

インクカートリッジ本体11の底面と同一面となるように形成され、かつ、これらの底面18には、小室12 a～cと大室12 d～fとにそれぞれ共通の位置決め溝19 a、19 dが凹設されていて、これらの溝19 a、19 d内には、各インク収容室12 a～fの底部と連通する円筒状のインク供給口20 a～20 fが、端縁をインク収容室12 a～fの各底面18と同じ高さになるように突出形成されていて、これらの各開口部は共通のテープ22 a、22 dによって封止されている。

【0023】またこのインクカートリッジ11には、図7（b）に示したように、その長手方向一方の側壁16の、隣接するインク収容室12 e、12 fを区画する隔壁13 hに誤装着防止用の溝24が設けられ、また、側壁16の上方にも誤装着防止用の隆条突起25が突出形成されていて、図示しないキャリッジに設けた突部と係合することができるか否かによって誤装着が防がれるように構成されている。

【0024】この実施例における誤装着防止用の溝24は、1番目と2番目のインク室12 e、12 fとを区画する隔壁13 hの部分に1本設けられているが、機種毎に位置を変えたり溝24の数を複数にするなど、溝24の位置と数との組み合わせによって各種のインクカートリッジを識別して誤装着を防ぐことができるように構成され、このことは、側壁16の上部に設ける誤装着防止用の突起25についても同様のことが言える。

【0025】これに対して図中符号30は、インクカートリッジ本体11の開口部を封止する蓋体で、この蓋体30は、本体11の開口部に設けた補強用リブ15の外縁と同じ平面形状をなし、かつ、この内面には、図5

（b）に示したように、インク収容室12 a～f内に収容したフォーム29を押圧する2列の縦リブ31、31が、各インク収容室12 a～f毎に設けられ、さらに、これらの縦リブ31、31はインク供給口20寄りの部分が他の部分よりも高く形成されていて、インク収容室12の内部に突出形成されたインク供給口20と協働してこの部分のフォーム29をより強く押圧して空孔を縮小することによって得られる強い毛細管作用により、フォーム29内に均一に吸収されたインクをインクの減少とともにインク供給口20の部分に集めることができるように構成されている。

【0026】他方、インクカートリッジ本体11の開口部を覆う蓋体30には、図8（b）に示したように、各インク収容室12 a～fに対応させてインクの充填と空気抜きを兼ねた通孔34 a～fが貫通形成され、またこの上面には、始端部が通孔34 a～fに連通し、末端が大室12 d～f側の上面に設けた通孔部36 a～fへ伸びるへび溝35が各インク収容室12 a～f毎に迷路状に形成され、かつ、大室12 d～fに連通するへび溝35 d～fよりも小室12 a～cに連通するへび溝35 a～cの方が遥かに長く形成されていて、フィルム38を

引剥して各インク収容室12a～f内を大気に開放した際に、小室12a～c内のインクの蒸発量を大室12d～fのインクの蒸発量よりも少なくするように構成されている。

【0027】これらのへび溝35については、また、図9(a)(b)に示したように、大室12d～fに連通するへび溝35d～fよりも小室12a～cに連通するへび溝35a～cの方の流路断面積を小さく形成して流路抵抗を大きくすることにより、小室12a～c内のインクの蒸発量を大室12d～fのインクの蒸発量よりも少なくするように構成することもできる。これらのへび溝35の末端の通孔部36a～fは一個所にまとめられた上、これらの通孔部36a～fの1つ、この実施例では、通孔部36dが引剥し方向に頂点を形成するよう三角形に配列することにより、フィルム38が容易に引剥せるように構成されている。

【0028】他方、この通孔34a～fに通じるへび溝35の上面を封止するフィルム38は、リール材を単純にカットすれば形成することができるよう、一边が蓋体30の巾に相当する寸法を有し、他辺が蓋体30の長さを越える寸法の長方形をなして、その一側には、通孔部36を大気に開放することができるような切れ込み39が設けられている。

【0029】このようにして構成されたインクカートリッジ本体11は、蒸気の透過度は低い、柔軟で強度的にも弱いポリプロピレンによって成形されているにも拘らず、開口部周縁に縦方向よりも横方向の巾を広くした補強用のリブ15によって、インクカートリッジ本体11の長手方向及び巾方向はほぼ均一に補強され、また、側壁16に設けた深さ方向のリブ17と、コーナー部分に開口部側から底面部側へ徐々に小さくなるように形成したアールR、rとにより、インクカートリッジ本体11の高さ方向も補強されることになって、その肉厚を可能な限り薄くしてインクの収容力を増大させると同時に、ポリプロピレンの持つ水蒸気の低透過率特性により、インクを劣化させることなく長期に保存することを可能にする。

【0030】しかも、インクカートリッジ本体11の側壁16に、底面18に達する深さ方向の誤装着防止用の溝24を隔壁13に沿わせるようにして設けたことにより、インク収容室12a～d内のフォーム29に影響を与えることなく、キャリッジに設けた係合突部との間でその誤装着の防止を図りつつ、キャリッジへの安定的な載置を図ることができる。

【0031】ところで、図5乃至図9で示した実施例は、インク収容室12a～fを左右に振り分け配置したインクカートリッジについての補強とインクの粘性の均一化に関するものであるが、これらの課題は、インク収容室の振り分け配置式のインクカートリッジに限らず図1に示した1列配置式のものにも適用し得ることは言う

までもなく、図10乃至12に示した実施例はこの種のインクカートリッジに関するものである。

【0032】このインクカートリッジ本体41には、マゼンタ、シアン及びイエローの各インクを収容するインク収容室42a～cと、これらよりも巾の広いブラックのインクを収容するインク収容室42dとがそれぞれ隔壁43を介して区画形成されている。

【0033】このインクカートリッジ本体41には、その開口部周縁に、縦横の強度が等しくなるように、巾方向よりも長手方向の巾を大とした補強用のリブ45が張出し形成され、また、巾方向及び長手方向の各側壁46には、図11に示したように、検出器の度当りを兼ねた変形防止用のリブ47が深さ方向に突出形成され、さらに、これらの側壁46のコーナ部分には、開口部側と底面部側の各肉厚をほぼ一定にした状態で、開口部側から底面部側へかけて内外のアールを徐々に小さくするように形成されている。

【0034】またさらに、このインクカートリッジ本体1には、その長手方向一端の側壁46に、底面48に達する誤装着防止用の溝54が隔壁に沿うように凹設され、また上方には誤装着防止用の隆条突起55が設けられていて、これらの誤装着防止用の溝54と隆条突起55を図示しないキャリッジの内部に突設した識別用の突起と凹部に係合させて、装着ミスをなくするように構成されている。

【0035】一方、これらのインク収容室42a～dの各底面48は、図12(a)に示したように、それぞれの隔壁43……に沿う溝49によって区画形成され、また、これらの底面的一端には、互いに結合し合った円筒状のインク供給口50a～dが突出形成され、さらに、これらのインク供給口50a～dは、外周を左右の枠52により短冊状に囲われた上、それぞれリブ51によって枠52に結合されている。

【0036】これらの、左右の枠52は、外側壁46よりも内側で、かつ両端のインク供給口50a、50dよりも若干突き出すような長さに形成されていて、これらの枠52からはみださないようにその上に1枚のテープ58を貼着して全てのインク供給口50a～dを同時に封止した上、このテープ58を枠52の端部で切り取るように構成されており、さらに、この枠52の頂稜部には空気を逃がす切欠き53が設けられていて、テープ58を確実に貼着することができるよう構成されている。

【0037】なお、図中符号56は、各インク供給口50a～dに嵌込まれて記録ヘッドに連通するプラスチック製のインク供給針との気密な結合を図るシールゴムを示している。

【0038】これに対して、図中符号60はインクカートリッジ本体41の開口部を封止する蓋体で、この蓋体60の内面には、図10に示したように、インク収容室

50a～d内に收容したフォーム59を押圧する2条の縦リブ61、61が各インク收容室42a～d毎に間隔をおいて突出形成されている。

【0039】この蓋体60には、図12(b)に示したように、その中央部とインク供給口50寄りの部分に、各インク收容室50a～dに対応させてインク充填孔63と空気抜き孔64が貫通形成され、また、この蓋体60の上面には、始端部が空気抜き孔64に連通し、末端が蓋体60の上面他半に設けた通孔部66a～dへと伸びるへび溝65が各インク收容室42a～d毎に迷路状に形成され、インクカートリッジを使用するに際し、この上を被覆しているフィルム67の他半部を引剥すことによって、各インク收容室42a～d内を大気開放すると同時に、この長いへび溝65によりもたらす大きな流路抵抗によって内部のインクが蒸発するのを防ぐように形成されている。

【0040】さらに、これらのへび溝65の末端の通孔66a～dは一個所にまとめられた上、これらの通孔部66a～dのうちの最も突出した通孔部66b、cを引剥し方向の頂点をなすように配列することにより、フィルム67がこの部分で容易に引剥せるように構成されている。

【0041】

【発明の効果】以上述べたように本発明によれば、複数のインク收容室のそれぞれに連通する各インク供給口を、インクカートリッジの一面に複数の列として配列するようにしたので、インク供給口を互い違いに配列するか、あるいはインク供給口とともにインク收容室を振り分け配置するかによって、インク收容室の厚み方向の寸法を、インク供給口の外径に規制されることなく十分小さくすることを可能となしてフルカラー形式のインクジェット記録装置に用いるこの種のインクカートリッジを可能な限り小型化することを可能にするとともに、インクカートリッジ内に区画形成したこれらのインク收容室の各底面をインク供給口の口端と略同一面となしたことにより、インクカートリッジの外形形状を他機種のものと同様外形形状に形成した場合でも、個々のインク收容室の容積を可能な限り大きくして、これらの交換頻度を軽減することができるばかりでなく、インクカートリッジの無駄をも省くことができる。

【0042】しかも、蓋体に設ける通気路を、小インク收容室に連通する通気路を大インク收容室に連通する通気路よりも長くしたことにより、僅かな蒸発によっても粘性が大きく変化する小インク收容室内のインクの蒸発を可能な限り抑えて、長期にわたって安定した記録書込みを行わせることができる。

【0043】またさらに、インクカートリッジ本体の開口部に、巾方向よりも長手方向の巾を大とした補強用のリブを設け、側壁には深さ方向に延びる補強用の突条を設けたので、柔軟な素材によって各色のカラーインク

を可能な限り多く收容し得るようインクカートリッジを肉薄に形成した場合でも、キャリッジの移送時とはもとより、その走行に伴う振動あるいは加速度の変動に対しても十分に耐えられる剛性を付与させることができ、さらには、この側壁に、底面に達する誤装着防止用の溝を機種毎に位置を違えて設けたことにより、この種のインクカートリッジを機種の如何に拘わりなく同じ外形をなすように形成した場合でも、キャリッジ側に設けた識別用の突起と係合させることによりその誤装着を確実に防ぐことができると同時に、この溝を隔壁に沿わせて設けることにより、限られたインク收容室の内容積を狭めることなく、また、内部に收容する弾性部材を変形させてインクの供給に支障を与えることなく、確実な識別性を持たせることができる。

【図面の簡単な説明】

【図1】本発明の一実施例をなすインクカートリッジの下面図と記録ヘッドとの関係を示した側面図である。

【図2】(a)(b)はいずれも本発明の他の実施例を示すインクカートリッジの底面図である。

【図3】(a)(b)はいずれも本発明のさらに別の実施例を示すインクカートリッジの底面図である。

【図4】(a)乃至(c)はいずれも本発明のさらに別の実施例を示すインクカートリッジの底面図である。

【図5】(a)(b)は本発明の他の実施例をなすインクカートリッジを断面で示した側面図と正面図である。

【図6】(a)(b)は同上インクカートリッジのコナ部分を断面で示した図である。

【図7】(a)(b)は同上インクカートリッジの外側面を示した側面図と正面図である。

【図8】(a)(b)は同上インクカートリッジの底面と蓋を示した図である。

【図9】(a)(b)はいずれもへび溝の断面について示した図である。

【図10】(a)(b)は本発明のさらに別の実施例をなすインクカートリッジを断面で示した側面図と正面図である。

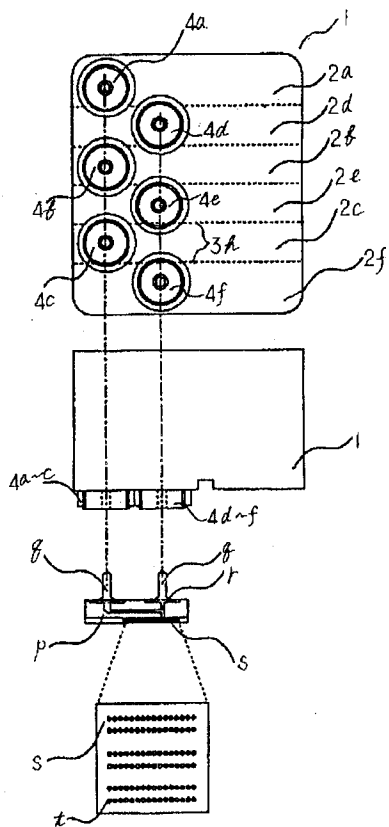
【図11】(a)(b)は同上インクカートリッジの外側面を示した側面図と正面図である。

【図12】(a)(b)は同上インクカートリッジの底面と蓋を示した図である。

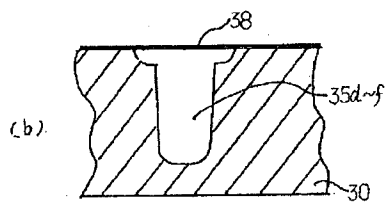
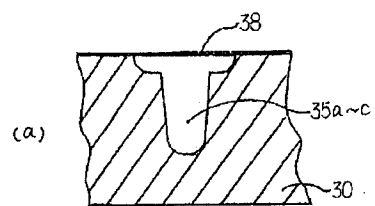
【符号の説明】

- 1、11、41 インクカートリッジ本体
- 2a～d、12a～f、42a～d インク收容室
- 3h、3v、13h、13v、43 隔壁
- 4a～d、20a～f、50a～d インク供給口
- 30、60 蓋体
- 34a～f、64a～d 通孔
- 35a～f、65 へび溝
- 38、67 フィルム

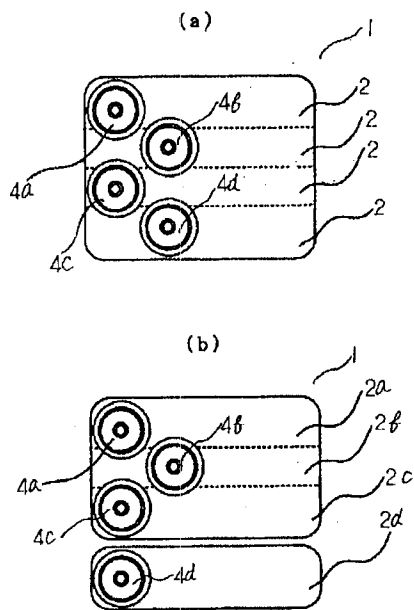
【図1】



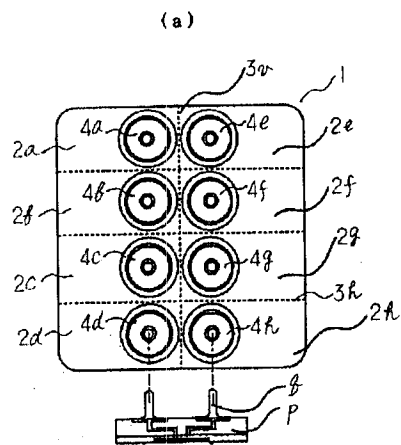
【図9】



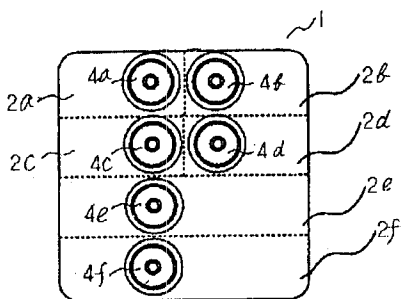
【図2】



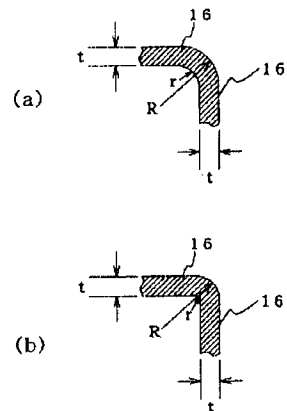
【図3】



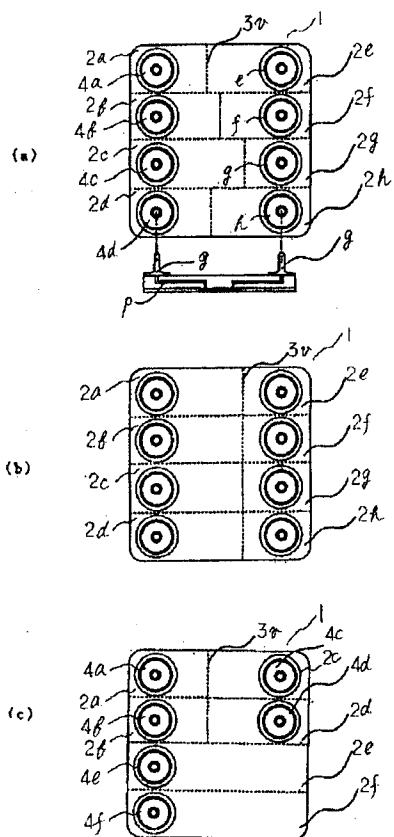
(b)



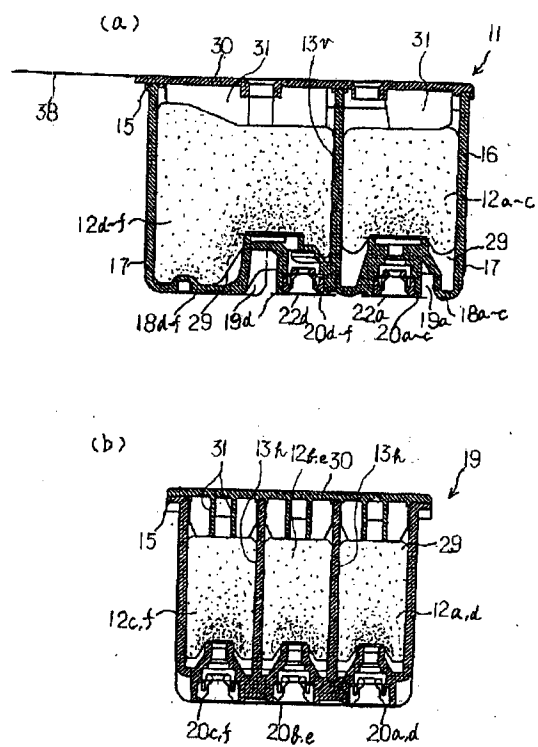
【図6】



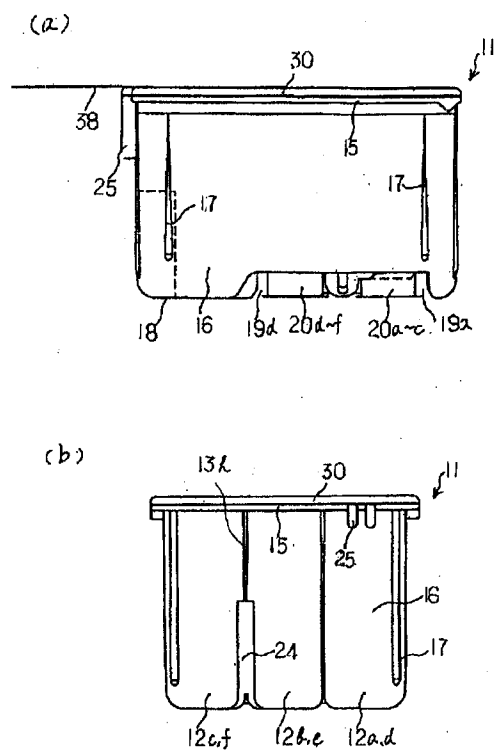
【图 4】



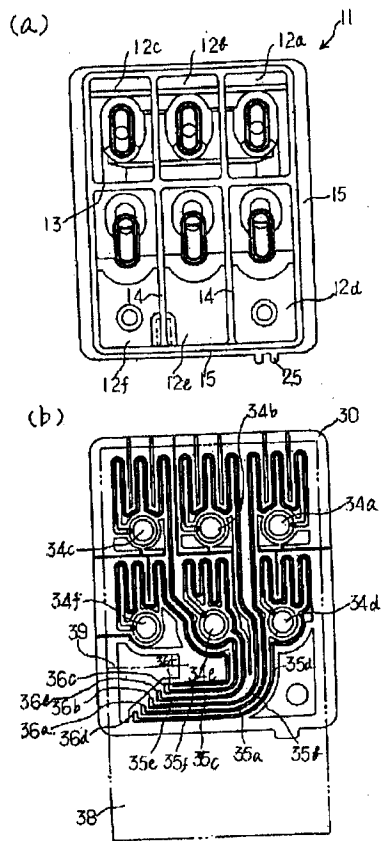
【図 5】



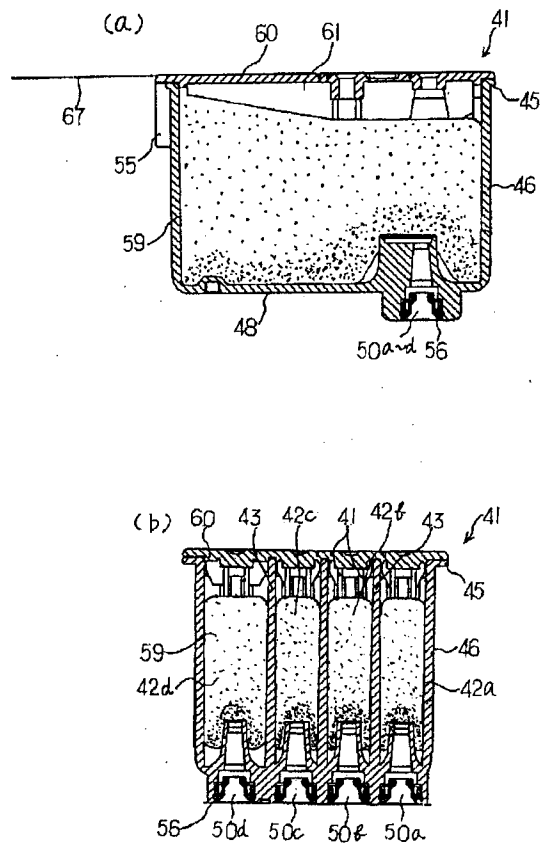
【図 7】



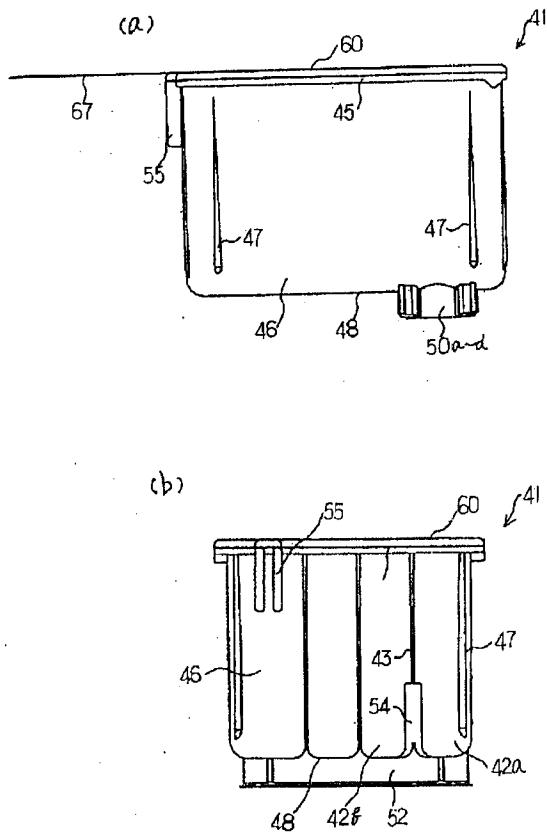
【図8】



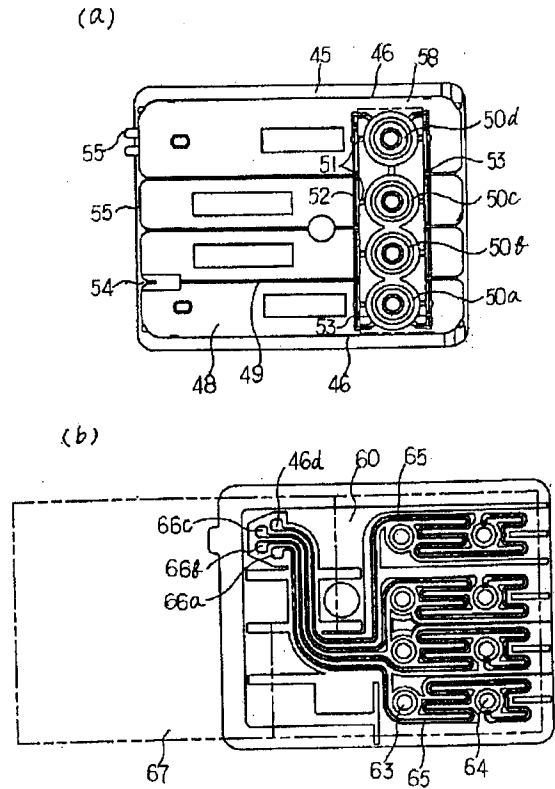
【図10】



【図11】



【図12】



フロントページの続き

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